



OFFICE OF THE  
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March 28, 2023

*Submitted via Federal eRulemaking Portal*

Mr. Michael S. Regan, Administrator  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington D.C. 20460  
a-and-r-Docket@epa.gov

**HARRIS COUNTY'S COMMENTS ON THE RECONSIDERATION OF THE  
NATIONAL AMBIENT AIR QUALITY STANDARDS FOR PARTICULATE MATTER**

RE: Proposed Rule Docket No. EPA-HQ-OAR-2015-0072

Dear Administrator Regan,

Harris County, Texas ("Harris County" or "County") appreciates the opportunity to submit comment in support of the reconsideration and lowering of the national ambient air quality standards ("NAAQS") for particulate matter by the U.S. Environmental Protection Agency ("EPA").

Background and EPA's Proposed Action

In April 2020, EPA made the final decision to retain the primary and secondary particulate matter 2.5 (PM<sub>2.5</sub>) standards.<sup>1</sup> However, new available scientific evidence and technical information indicates that the current standards may not be adequate to protect human health and welfare.<sup>2</sup> This prompted EPA to announce the reconsideration of its 2020 decision on PM<sub>2.5</sub>.<sup>3</sup>

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<sup>1</sup> 88 Fed. Reg. 5560 (January 2023).

<sup>2</sup> *Id.*

<sup>3</sup> *Id.*

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EPA is proposing to revise the primary PM<sub>2.5</sub> standards. The primary annual PM<sub>2.5</sub> standard is currently set at 12 µg/m<sup>3</sup>.<sup>4</sup> EPA is proposing to set the annual standard to a range of 9.0 to 10.0 µg/m<sup>3</sup>.<sup>5</sup> Alternatively, EPA is taking comment on lowering the annual standard level down to 8.0 µg/m<sup>3</sup> and up to 11.0 µg/m<sup>3</sup>.<sup>6</sup> Harris County supports EPA's reconsideration and advocates for the standard to be lowered to a range of 9.0 to 10.0 µg/m<sup>3</sup>.

### Particulate Matter Health and Environmental Impacts

Particulate matter pollution is produced by a variety of sources. Industrial sources, heavy traffic, densely populated areas, and other human activity contribute to higher levels of PM<sub>2.5</sub> in Texas.<sup>7</sup> Particulate matter exposure can cause a plethora of health and environmental effects. Some of the health effects include but are not limited to:

- premature death in people with heart or lung disease;
- nonfatal heart attacks;
- irregular heartbeat;
- aggravated asthma;
- decreased lung function; and
- increased respiratory symptoms (irritation of airways, coughing, difficulty breathing).<sup>8</sup>

Sensitive populations, which include people with heart or lung diseases, children, and older adults, are the most impacted by particulate matter exposure.<sup>9</sup> According to the American Lung Association, people at the greatest risk from particulate pollution exposure include: infants, children, and teens; people with lung disease, especially asthma, but also people with chronic obstructive pulmonary disease; people with cardiovascular disease; people of color; current or former smokers; people with low incomes; and people who are obese".<sup>10</sup>

As for environmental effects, PM<sub>2.5</sub> is the leading cause of reduced visibility or haze.<sup>11</sup> Impaired visibility is caused when PM<sub>2.5</sub> alters the way the light is absorbed and scattered in the

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<sup>4</sup> *Id.*

<sup>5</sup> *Id.*

<sup>6</sup> *Id.*

<sup>7</sup> Masoud Ghahremanloo, Yunsoo Choi, Alqamah Sayeed, Ahmed Khan Salman, Shuai Pan, Meisam Amani, Estimating daily high-resolution PM<sub>2.5</sub> concentrations over Texas: Machine Learning approach, *Atmospheric Environment*, Vol. 247, 26 (2021). <https://www.sciencedirect.com/science/article/abs/pii/S1352231021000273>

<sup>8</sup> U.S. EPA, Health and Environmental Effects of Particulate Matter (PM). <https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm>; Fine particulate pollution can "cause early death; cardiovascular harm (heart attacks, strokes, heart disease, congestive heart failure); and is likely to cause respiratory harm (worsen asthma, worsen COPD, inflammation); cancer; harm to the nervous system (reduced brain volume, cognitive effects); and may cause reproductive and developmental harm." American Lung Association, Particle Pollution. <https://www.lung.org/clean-air/outdoors/what-makes-air-unhealthy/particle-pollution>.

<sup>9</sup> U.S. EPA, Health and Environmental Effects of Particulate Matter (PM).

<sup>10</sup> American Lung Association, Particle Pollution.

<sup>11</sup> U.S. EPA, Health and Environmental Effects of Particulate Matter (PM).

atmosphere.<sup>12</sup> Additionally, PM<sub>2.5</sub> negatively affects climate, ecosystems, and materials.<sup>13</sup> Particulate matter mixtures can have either warming or cooling properties that impact climate change.<sup>14</sup> For instance, black carbon can have a warming influence and nitrate and sulfate can have cooling influence.<sup>15</sup> Both can contribute to climate change. Particulate matter can also adversely affect ecosystems through plants, soil, and water.<sup>16</sup> Metal and organic compounds in PM can alter plant growth and yield, and PM in water can affect quality and clarity.<sup>17</sup> Particulate matter pollutions can have devastating effects environmentally; therefore, lowering the annual average would help reduce these negative impacts.

### Environmental Justice Impacts

Heightened PM exposure has detrimental effects on the entire population, especially given PM's transient nature. However, communities of color and low-income communities are disproportionately exposed to higher PM<sub>2.5</sub> concentrations nationwide.<sup>18</sup> Notably, people of color are subject to higher pollution concentrations even when controlling for income.<sup>19</sup>

EPA has noted that Hispanics, Asians, Blacks, and those with less than a high school education have higher national annual exposures, on average and across the distributions, than both the overall reference population or other populations (e.g., non-Hispanic, White, and more educated). The Hispanic population is estimated to experience the highest exposures, both on average and across PM<sub>2.5</sub> concentration distributions, of all demographic groups EPA analyzed.<sup>20</sup> Additionally, Asians, Blacks, and Hispanics live in areas with higher annual PM<sub>2.5</sub> concentrations.<sup>21</sup>

Regarding short-term exposure, one study found that most short-term PM<sub>2.5</sub> exposure for people of color within the U.S EPA regions were above average, and few were below average.<sup>22</sup> Further, the study found that the total population-weighted mean exposure for the 2012–2016 period were highest among non-Hispanic Asian people for days with PM<sub>2.5</sub> ≥ 15 and 25 µg/m<sup>3</sup> and highest among Hispanic/Latina/x/o people for days with PM<sub>2.5</sub> ≥ 35 µg/m<sup>3</sup>. Overall, the study

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<sup>12</sup> California Air Resources Board, Inhalable Particulate Matter and Health (PM<sub>2.5</sub> and PM<sub>10</sub>).

<https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health>

<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> *Id.*

<sup>18</sup> See generally Richard L. Revesz, *Air Pollution and Environmental Justice*, 49:187 Ecology L. Q. at 210-226 (2022)

<sup>19</sup> *Id.* at 211; Ihab Mikati, et. al., *Disparities in Distribution of Particulate Matter Emission Sources by Race and Poverty Status*, 108(4) Am. J. Pub. Health at 480 (2018) (“Disparities for Blacks are more pronounced than are disparities on the basis of poverty status. Strictly socioeconomic considerations may be insufficient to reduce PM burdens equitably across populations”).

<sup>20</sup> EPA, Regulatory Impact Analysis for the Proposed Reconsideration of the National Ambient Air Quality Standards for Particulate Matter, ES-21 (2022) [Hereinafter RIA].

<sup>21</sup> *Id.* at 6-8

<sup>22</sup> Timothy W. Collins & Sarah E. Grineski, *Racial/Ethnic Disparities in Short-Term PM<sub>2.5</sub> Air Pollution Exposures in the United States*, Env't Health Perspectives, Aug. 2022 at 087701-1, 087701-3.

claimed to reveal an “environmentally unjust pattern” of short-term air pollution exposure disparities for people of color.<sup>23</sup>

### *Harris County Environmental Justice Communities are Especially Vulnerable*

The unfortunate reality is that minority and low-income communities often bear the disproportional brunt of environmental harm and pollution in Harris County, and many textbook environmental justice (“EJ”) communities reside here. Harris County is home to 4.7 million people, is the most populous county in Texas and along the Gulf of Mexico, and is one of the most ethnically diverse places in the country. In addition to containing Houston, the fourth largest city in the U.S, Harris County is home to a large concentration of industry, oil refineries, and a large port. Heavy commuter traffic, heightened presence of industry, emissions events and chemical disasters, smog, and other factors all contribute to poor air quality. Houston is the largest U.S city without zoning laws, which further compounds the air quality problem for the communities that are quite literally at the fence-line of industry. Some EJ communities live within very close proximity to upwards of 15 industrial and toxic waste facilities.<sup>24</sup>

Harris County has suffered from poor air quality for decades. Particulate and ozone pollution are of particular concern. The Houston-Galveston-Brazoria area (“HGB area”) has never met any of the ozone standards at the time of their initial implementation, and EPA recently reclassified our area as a Moderate nonattainment area for the 2015 ozone NAAQS and as a Severe nonattainment area for the 2008 ozone NAAQS. While Harris County is currently designated as “unclassifiable/attainment” for PM<sub>10</sub> and PM<sub>2.5</sub>, the area has long been considered “at-risk” for PM nonattainment and will likely be classified as nonattainment should EPA adopt the newly proposed PM<sub>2.5</sub> NAAQS.

Studies show poor air quality disproportionately effects minority and low-income populations in Harris County. For example, one study found that levels of NO<sub>2</sub>, linked to higher rates of several health issues, were 32% higher for Houston’s Latino residents, 19% higher for Black residents, and 15-28% higher for residents living below the poverty line.<sup>25</sup> Another study found that Black children in Houston were twice as likely to suffer from asthma compared to white children of the same age, and Hispanic children had 22% higher odds of having asthma than white children.<sup>26</sup> A 2006 Report from the Houston Mayor’s Task Force on the Health Effects of Air Pollution identified that the nine Houston “super neighborhoods” along the Houston Ship Channel, which contains several majority Black and / or Latino neighborhoods, were “far more vulnerable to health risks than others in Greater Houston” on “the basis of location alone.” The study noted

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<sup>23</sup> *Id.* at 087701-1

<sup>24</sup> Double Jeopardy in Houston: Acute and Chronic Chemical Exposures Pose Disproportionate Risks for Marginalized Communities, Union of Concerned Scientists & Texas Environmental Justice Advocacy Service, 14 (2016) <https://www.ucsusa.org/sites/default/files/attach/2016/10/ucs-double-jeopardy-in-houston-full-report-2016.pdf>.

<sup>25</sup> Krystal Vasquez, *Measuring Houston’s environmental injustice from space*, Env’t Health News, (July 20, 2021) <https://www.ehn.org/environmental-justice-houston-2653843877.html>.

<sup>26</sup> Amy McCaig, *Black Children in Houston at higher risk for asthma*, Rice U., (Mar. 20, 2017) <https://news2.rice.edu/2017/03/20/black-children-in-houston-at-higher-risk-for-asthma/>.

that, in addition to the close proximity to a large concentration of industry and point sources for air pollution, four major highways intersected the area.<sup>27</sup>

EPA itself has noted the high pollution burdens our EJ communities face. In denying Texas's request for a 1-year extension of the ozone NAAQS attainment date for the HGB Ozone Nonattainment Area, EPA in part based their decision on their "consideration of existing pollution burdens for some communities within the area."<sup>28</sup> EPA has noted that communities residing and working near violating ozone monitors in the Houston area and the Houston Ship Channel are exposed to "a significant and disproportionate burden of ozone pollution and other sources of pollution (e.g., vehicle traffic and *particulate matter emissions*) compared to the greater Houston area and the U.S. as a whole."<sup>29</sup>

Communities outside of the ship channel have also dealt with the inequitable distribution of environmental hazards, and specifically with heightened PM exposure. Settegast, a neighborhood in northeast Houston, is bordered by a Union Pacific railroad-switching yard, the Interstate 610 Loop, and Old Beaumont Highway.<sup>30</sup> The neighborhood was developed as a planned community in the 1940s and was advertised specifically to African-Americans, who populated the neighborhood.<sup>31</sup> It was annexed by the City of Houston in 1949, but despite annexation nearly 20 years prior, a 1966 report noted that the neighborhood had no city water, no sanitary sewers, and no drainage facilities at that time.<sup>32</sup>

Community members have long voiced concern regarding air pollution in the area,<sup>33</sup> and a PM<sub>2.5</sub> monitor was deployed in the Settegast neighborhood in summer 2021 on North Wayside Drive (Wayside Monitor). The Wayside Monitor has continuously given high readings — the highest in the County. For the nearly 9 months of 2021 it was installed (May 3 – December 31), the annual mean was 12.7 µg/m<sup>3</sup>. The annual mean for the 2022 calendar year was 11.8 µg/m<sup>3</sup>. The mean for January 2023 was 12.4 µg/m<sup>3</sup>, the mean for February 2023 was 12.1 µg/m<sup>3</sup>, and the annual mean for 2023 as of March 20<sup>th</sup> is 13.4 µg/m<sup>3</sup>.<sup>34</sup>

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<sup>27</sup> A Closer Look at Air Pollution in Houston: Identifying Priority Health Risks, 21 (2006) <http://www.greenhoustontx.gov/reports/UTreport.pdf>

<sup>28</sup> Determinations of Attainment by the Attainment Date, Extensions of the Attainment Date, and Reclassification of Areas Classified as Serious for the 2008 Ozone National Ambient Air Quality Standards, 87 Fed. Reg. 60,926, 60,927 (2022).

<sup>29</sup> *Id.* at 60,928 (emphasis added).

<sup>30</sup> *Super Neighborhoods, Super Neighborhood 50 – Settegast*, <https://www.houstontx.gov/superneighborhoods/50.html> (last visited Mar. 20, 2023).

<sup>31</sup> *Id.*; Rafael Longoria & Susan Rogers, The Rurban Horseshoe, Rice Design Alliance, 20 (2008) [http://offcite.org/wp-content/uploads/2009/10/Cite\\_73\\_Rurban\\_Horseshoe\\_LongoriaRogers.pdf](http://offcite.org/wp-content/uploads/2009/10/Cite_73_Rurban_Horseshoe_LongoriaRogers.pdf); Protected Landmark Designation Report, City of Houston, 2 (2021) [https://www.houstontx.gov/planning/Commissions/docs\\_pdfs/A\\_7977%20TATE%20ST.%20PL%20NOMINATION.pdf](https://www.houstontx.gov/planning/Commissions/docs_pdfs/A_7977%20TATE%20ST.%20PL%20NOMINATION.pdf)

<sup>32</sup> Luis Guarjardo, *Settegast: A case study in endemic racism within Houston's housing system*, Rice Kinder Inst. Urb. Rsrch., (Jul. 2, 2020) <https://kinder.rice.edu/urbanedge/settegast-case-study-endemic-racism-within-houstons-housing-system>.

<sup>33</sup> Fern Uennatornwarangoon, *Houston may exceed national standards for harmful fine particulate matter, new monitoring shows*, Env't Defense Fund, (May 4, 2022) <https://globalecleanair.org/monitoring/houston-may-exceed-national-standards-for-harmful-fine-particulate-matter-new-monitoring-shows/>.

<sup>34</sup> *Daily Mean Values for Calendar Year 2022, Houston-Galveston-Brazoria, CAMS 405 Houston North Wayside C405/C1033*, TCEQ, [https://www.tceq.texas.gov/cgi-bin/compliance/monops/24hr\\_annual.pl](https://www.tceq.texas.gov/cgi-bin/compliance/monops/24hr_annual.pl) (last visited Mar. 20).

The area within a 5-mile radius of the Wayside Monitor is 96% people of color, 60% low income, and in the 98<sup>th</sup> Percentile of the U.S for the PM<sub>2.5</sub> EJ Index. There are 2 Superfund NPLs and 14 Hazardous Waste Treatment, Storage, and Disposal Facilities in the area.



 		
<b>EJScreen Report (Version 2.11)</b> 5 miles Ring Centered at 29.828284,-95.284038 TEXAS, EPA Region 6 Approximate Population: 197,785 Input Area (sq. miles): 78.53 5 Mile Radius from Wayside Monitor		
Selected Variables	Percentile in State	Percentile in USA
<b>Environmental Justice Indexes</b>		
Particulate Matter 2.5 EJ Index	95	98
Ozone EJ Index	63	54
Diesel Particulate Matter EJ Index*	97	95
Air Toxics Cancer Risk EJ Index*	95	98
Air Toxics Respiratory HI EJ Index*	95	97
Traffic Proximity EJ Index	84	88
Lead Paint EJ Index	91	91
Superfund Proximity EJ Index	95	97
RMP Facility Proximity EJ Index	81	90
Hazardous Waste Proximity EJ Index	93	89
Underground Storage Tanks EJ Index	88	92
Wastewater Discharge EJ Index	89	92
<small>EJ Indexes - The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator</small>		

Image A: Environmental Justice Indexes for area within five-mile ring of Wayside Monitor

3/20/23, 4:10 PM

EJScreen Report

Superfund NPL					2
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)					14

Selected Variables	Value	State		USA	
		Avg.	%tile	Avg.	%tile
Pollution and Sources					
Particulate Matter 2.5 (µg/m³)	10.5	9.5	93	8.67	90
Ozone (ppb)	36.7	40	29	42.5	16
Diesel Particulate Matter* (µg/m³)	0.459	0.211	97	0.294	80-90th
Air Toxics Cancer Risk* (lifetime risk per million)	41	31	95	28	95-100th
Air Toxics Respiratory HI*	0.48	0.35	98	0.36	90-95th
Traffic Proximity (daily traffic count/distance to road)	1100	570	87	760	83
Lead Paint (% Pre-1980 Housing)	0.43	0.14	85	0.27	68
Superfund Proximity (site count/km distance)	0.46	0.084	97	0.13	94
RMP Facility Proximity (facility count/km distance)	1.3	0.94	77	0.77	81
Hazardous Waste Proximity (facility count/km distance)	1.6	0.72	87	2.2	66
Underground Storage Tanks (count/km²)	4.2	2.3	81	3.9	73
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.073	0.38	91	12	83
Socioeconomic Indicators					
Demographic Index	78%	46%	89	35%	94
Supplemental Demographic Index	30%	17%	90	15%	94
People of Color	96%	59%	87	40%	93
Low Income	60%	33%	84	30%	88
Unemployment Rate	9%	5%	80	5%	80
Limited English Speaking	20%	7%	87	5%	93
Less Than High School Education	36%	16%	86	12%	94
Under Age 5	7%	7%	60	6%	68
Over Age 64	13%	13%	53	16%	39
Low Life Expectancy	24%	20%	90	20%	88

EJScreen is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJScreen outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

Selected Variables	Percentile in State	Percentile in USA
Supplemental Indexes		
Particulate Matter 2.5 Supplemental Index	95	98
Ozone Supplemental Index	66	46
Diesel Particulate Matter Supplemental Index*	96	96
Air Toxics Cancer Risk Supplemental Index*	94	97
Air Toxics Respiratory HI Supplemental Index*	94	97
Traffic Proximity Supplemental Index	88	91
Lead Paint Supplemental Index	92	92

[https://eiscreen.epa.gov/mapper/eiscreen\\_SOF.aspx](https://eiscreen.epa.gov/mapper/eiscreen_SOF.aspx)

[https://ejscreen.epa.gov/mapper/ejscreen\\_SOE.aspx](https://ejscreen.epa.gov/mapper/ejscreen_SOE.aspx)

4/5

Image B: Sites Reporting to the EPA and Socioeconomic Indicators for area within five-mile ring of Wayside Monitor



According to federal estimates, Settegast also has the lowest life expectancy of any neighborhood in Harris County, which at 66 is around 20 years less than the neighborhoods with the highest life expectancy.<sup>35</sup> Given the well-known health effects of heightened PM exposure, it is unfortunately unsurprising that the neighborhood with the highest PM readings also has the lowest life expectancy in the County. Settegast is just one of many EJ communities in Harris County, others include Manchester, the historic Fifth Ward/Kashmere Gardens, Aldine, and Pleasantville. In these communities, the cumulative impacts of multiple environmental harms, including particulate matter, are disproportionately felt and can have fatal consequences. Therefore, the County asks that EPA set NAAQS at a level to protect the health of the communities like Settegast and those along the Houston Ship Channel.

*Lowering the current NAAQS will help to alleviate the health burden put on our County's EJ communities*

In the Southeast region, which includes Harris County, EPA has estimated that Hispanics and Asians will experience proportionally larger reductions in mortality rates when moving from current standard to alternative standard levels associated with control strategies. Black people will experience proportionally larger reductions in mortality rates for 12/35 – 9/35  $\mu\text{g}/\text{m}^3$  and 12/35 – 8/35  $\mu\text{g}/\text{m}^3$ .<sup>36</sup>

EPA must establish primary standards that are requisite to protect public health with an adequate margin of safety, including the health of sensitive groups and vulnerable populations.<sup>37</sup> EPA has discretion in determining how to best account for an adequate margin of safety.<sup>38</sup> To fulfill the goals of the CAA, EPA must weigh how PM exposure disproportionately affects vulnerable EJ populations like those in Harris County and set the standard at a level that is protective of their health.

### The Annual PM<sub>2.5</sub> Standard Should Be Lowered

The existing primary particulate matter standards do not protect the public health and welfare. In September 2021, The World Health Organization (WHO) updated their air quality guidelines and recommended a more stringent limit on annual PM<sub>2.5</sub> exposure.<sup>39</sup> WHO

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<sup>35</sup> R.A. Shuetz, *This neighborhood has the shortest life expectancy in Harris County. A grant is trying to change that.*, Hous. Chron. (Last updated Jan. 27, 2023) <https://www.houstonchronicle.com/news/houston-texas/housing/article/harris-county-life-expectancy-settegast-grant-17713960.php>.

<sup>36</sup> *RIA*, *supra* note 20 at 6-31

<sup>37</sup> 42 U.S.C.A. § 7409(b)(1) (West); S. Rep. No. 91-1196, 91st Cong., 2d Sess. 10 [1970]; *Am. Lung Ass'n v. E.P.A.*, 134 F.3d 388, 389 (D.C. Cir. 1998).

<sup>38</sup> *Mississippi v. E.P.A.*, 744 F.3d 1334, 1353 (D.C. Cir. 2013) (“Our case law has left EPA with a wide berth when it comes to deciding how best to account for an adequate margin of safety”); *Lead Indus. Ass'n, Inc. v. Env'tl. Prot. Agency*, 647 F.2d 1130, 1162 (D.C. Cir. 1980) (“The choice between these possible approaches is a policy choice of the type that Congress specifically left to the Administrator's judgment. This court must allow him the discretion to determine which approach will best fulfill the goals of the Act”).

<sup>39</sup> World Health Organization, WHO global air quality guidelines: particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide (2021). <https://apps.who.int/iris/bitstream/handle/10665/345334/9789240034433-eng.pdf>

recommends an even more stringent standard than EPA has proposed. WHO recommends that the limit on annual PM<sub>2.5</sub> exposure be 5 µg/m<sup>3</sup> because additional evidence has shown the detrimental impacts of PM<sub>2.5</sub> on health.<sup>40</sup> Within the updated guidelines, WHO cites and references numerous scientific evidence showing the health effects of air pollution, specifically PM<sub>2.5</sub>.<sup>41</sup> Harris County is not advocating for the annual PM<sub>2.5</sub> standard to be lowered to 5 µg/m<sup>3</sup>, but does support it being lowered to 9.0 to 10.0 µg/m<sup>3</sup> to protect human health and welfare.

While EPA is prohibited from considering implementation costs when setting NAAQS,<sup>42</sup> Harris County notes that failing to lower the annual PM<sub>2.5</sub> standards will lead to economic impacts. Air pollution can lead to health-related economic impacts, like human health costs, lost labor productivity, and other economic costs.<sup>43</sup> Human-health costs are related to costs of disease and mortality.<sup>44</sup> Lost labor productivity costs include lost labor income and welfare losses from exposure to PM<sub>2.5</sub>.<sup>45</sup> Lastly, other economic costs are experienced through the impact of air pollution on agricultural crops, and damage to buildings and infrastructure.<sup>46</sup> All of these losses have a negative impact on our economy.

The Clean Air Scientific Advisory Committee (“CASAC”) members support lowering the PM<sub>2.5</sub> standards.<sup>47</sup> The majority of CASAC members support the alternative standard proposed of 8.0 – 10.0 µg/m<sup>3</sup> and the minority of CASAC members find that a range of 10.0 – 11.0 µg/m<sup>3</sup> is appropriate.<sup>48</sup> The majority of CASAC rely on 2020 epidemiologic studies in the United States that show positive associations between PM<sub>2.5</sub> and mortality and epidemiologic studies showing those associates at concentrations below 10 µg/m<sup>3</sup>.<sup>49</sup> The minority of CASAC members emphasize that there are a few key epidemiologic studies that report positive and statistically significant health effects associated with mean concentrations of PM<sub>2.5</sub> below 9.6 µg/m<sup>3</sup> and that design values are usually higher than area average exposure levels.<sup>50</sup> Additionally, the minority considers the uncertainties related to co-pollutants and confounders, which in their opinion make it difficult to justify a recommendation below 10 – 11 µg/m<sup>3</sup>.<sup>51</sup> Undoubtedly, the scientific studies and technologies support the lowering of the current PM<sub>2.5</sub> standards.

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<sup>40</sup> *Id.*

<sup>41</sup> *Id.* at 13 – 16.

<sup>42</sup> *Whitman v. American Trucking Associations*, 531 U.S. 457, 465-472, 475-476 (2001).

<sup>43</sup> *Id.* at 11.

<sup>44</sup> These costs are estimated by a willingness-to-pay approach. *Id.*

<sup>45</sup> In 2013, the World Bank estimated globally an economic impact of about \$143 billion. (World Bank, 2016). *Id.*

<sup>46</sup> Other air pollution-related costs include climate change and environmental degradation. *Id.*

<sup>47</sup> CASAC, CASAC Review of the EPA’s Policy Assessment for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter (External Review Draft – October 2021).

<sup>48</sup> *Id.*

<sup>49</sup> *Id.* at 16.

<sup>50</sup> “Key U.S. epidemiologic studies indicate consistently positive and statistically significant health effect associations based on air quality distributions with area average mean PM<sub>2.5</sub> concentrations at or above 9.9 µg/m<sup>3</sup> for monitor-based studies, at 9.3 µg/m<sup>3</sup> for hybrid modeling with population-weighted averages of grid cells and ranging between 9.8-12.2 µg/m<sup>3</sup> for hybrid modeling with unweighted averages of grid cells averaged to the same resolution as the study data”. *Id.* at 17.

<sup>51</sup> *Id.*



Furthermore, the Regulatory Impact Analysis (RIA) estimates the benefits to human health and the environment of the proposed lower standards of PM<sub>2.5</sub>.<sup>52</sup> The RIA estimates that by 2032 the emissions reduced by the applied control strategies for the proposed annual primary standards would decrease PM<sub>2.5</sub>-related premature deaths and illnesses.<sup>53</sup> While the RIA does not quantify the welfare benefits, it provides important information about those public health benefits associated with the revised NAAQS.<sup>54</sup> The assessment provides detailed data<sup>55</sup>, which clearly demonstrates that lowering the PM<sub>2.5</sub> will have tremendous benefits to public health and welfare.

Recent studies have corroborated that a more stringent PM<sub>2.5</sub> annual average is necessary to truly protect public health and welfare. In May 2021, the Harvard T.H. Chan School of Public Health led a study that focused on the effects of reduction of certain air pollutants, including fine particulate matter.<sup>56</sup> The study determined that PM<sub>2.5</sub> is linked to significant harmful effects on human health, even at low levels.<sup>57</sup> It was also established that even small reductions in exposure can have substantial health benefits.<sup>58</sup>

Moreover, in 2021, the estimated daily high-resolution PM<sub>2.5</sub> concentrations throughout Texas were studied between the years of 2014 to 2018.<sup>59</sup> This study estimates respiratory-related premature mortality cases due to changes in PM<sub>2.5</sub> levels within Texas.<sup>60</sup> According to the study, the following counties had the largest number of preventable premature mortalities—Harris, Dallas, Tarrant, Bexar, and El Paso counties.<sup>61</sup> Of the counties listed, Harris County had the largest number of preventable premature mortalities.<sup>62</sup> The intensity of changes in PM<sub>2.5</sub> levels throughout these counties had a major impact on differences among the numbers of preventable premature mortalities.<sup>63</sup> The study goes on to state that the analysis shows a decrease in PM<sub>2.5</sub> concentrations from 2015 to 2018, which could have prevented several thousands of respiratory-related premature mortalities in Texas.<sup>64</sup> It is apparent that the data indicates a significant positive impact of PM<sub>2.5</sub> reduction on human health.<sup>65</sup> Overall data has demonstrated over the years that any reduction in exposure to particulate matter pollution has immense benefits. Thus, lowering the annual average will have extraordinary benefits and will help protect the public health and welfare.

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<sup>52</sup> U.S. EPA, Regulatory Impact Analysis for the Proposed Reconsideration of the National Ambient Air Quality Standards for Particulate Matter, Chapter 5: Benefits Analysis Approach and Results, 5-38 (2022).

<sup>53</sup> *Id.*

<sup>54</sup> *Id.* at 5-38 – 5-39.

<sup>55</sup> See tables 5A-1 – 5A-5. *Id.* at 5A-3 – 5A-7.

<sup>56</sup> Harvard T.H. Chan School of Public Health, Strong air pollution standards in U.S. would have significant public health benefits (May 26, 2021). <https://www.hsph.harvard.edu/news/features/stronger-air-pollution-standards-in-u-s-would-have-significant-public-health-benefits/>

<sup>57</sup> *Id.*

<sup>58</sup> *Id.*

<sup>59</sup> Masoud Ghahremanloo, Yunsoo Choi, Alqamah Sayeed, Ahmed Khan Salman, Shuai Pan, Meisam Amani, Estimating daily high-resolution PM<sub>2.5</sub> concentrations over Texas: Machine Learning approach, Atmospheric Environment at 29.

<sup>60</sup> *Id.*

<sup>61</sup> *Id.*

<sup>62</sup> *Id.*

<sup>63</sup> *Id.* at 31.

<sup>64</sup> *Id.* at 31.

<sup>65</sup> *Id.*

The vast majority of information, studies, and technical reports all support lowering the average annual PM<sub>2.5</sub> standard. It is undisputable that lower levels of exposure to PM<sub>2.5</sub> have health and environmental benefits. It is imperative to follow the science and protect human health and welfare by lowering the PM standards. Therefore, Harris County considering the immense body of scientific information supports EPA's proposal to lower the annual PM<sub>2.5</sub> average to 9.0 to 10.0 µg/m<sup>3</sup>.

### Conclusion

The current PM<sub>2.5</sub> standards fail to protect the public's health and welfare. Thus, Harris County supports EPA's recommendation to lower the annual average to 9.0 to 10.0 µg/m<sup>3</sup>. However, if EPA decides on the even lower standard of 8.0 µg/m<sup>3</sup> because science and the technical studies support this; Harris County supports EPA's decision.

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Thank you for the opportunity to comment on the proposed PM standards. If you have any questions, please feel free to contact Elizabeth Hidalgo at [elizabeth.hidalgo@harriscountytexas.gov](mailto:elizabeth.hidalgo@harriscountytexas.gov).

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